## Main PSoC to Display PSoC protocol over SPI interface

Pins use 3.3V logic levels

### Commands:

Message is build of 28 bajts that comprise:

1 – header = 0x01h

2 – 25 - input\_table[] - table returned by SPI slave routine containing 24 ASCI characters

26 – word1 representing BeoModern state: disp\_ctrl1 - Each bit represents LED on front interface

1. CTRL0.0 - Player
2. CTRL0.1 - iRadio
3. CTRL0.2 - DAB Radio
4. CTRL0.3 - Aux IN
5. CTRL0.4 - Clock
6. CTRL0.5 - RDS/FM Display
7. CTRL0.6 - BT Rx
8. CTRL0.7 - NOT USED

27 – word2 representing BeoModern state on parallel tasks: disp\_ctrl2 - Each bit represents LED or mode of operation of display unit

1. CTRL1.0 - BT Tx
2. CTRL1.1 - Online status
3. CTRL1.2 - Signal Level
4. CTRL1.3 - Spectrum Analyser
5. CTRL1.4 - Clock 1
6. CTRL1.5 - Clock 2
7. CTRL1.6 - NOT USED
8. CTRL1.7 - NOT USED

28 – stop bajt = 0x17h

SYSTEM\_STATE = 0 - power down - NO COMMANDS from RPi

SYSTEM\_STATE = 1 - Player - COMMANDS

SYSTEM\_STATE = 2 - iRadio - COMMANDS

SYSTEM\_STATE = 3 - DAB Radio - COMMANDS

SYSTEM\_STATE = 4 - Aux IN - NO COMMANDS from RPi -> static message

SYSTEM\_STATE = 5 - Clock - NO COMMANDS from RPi -> static message

SYSTEM\_STATE = 6 - RDS/FM display- COMMANDS

SYSTEM\_STATE = 7 - BlueTooth Rx - NO COMMANDS from RPi -> BT sents notes

SYSTEM\_STATE = 8 - BlueTooth Tx - NO COMMANDS from RPi -> BT sents notes

DISPLAY\_STATE = 1 - Data - sent to display commands from RPi, BT or static

DISPLAY\_STATE = 2 - signal level - sent signal level info from SigmaDSP

DISPLAY\_STATE = 3 - spectrum analyser - sent spectrum analyzer info from SigmaDSP

DISPLAY\_STATE = 4 - Clock 1 - sent note to display Clock 1

DISPLAY\_STATE = 5 - Clock 2 - sent note to display Clock 2

DISPLAY\_STATE = 6 - blank - No data on display (sent spaces)

### In DISPLAY\_STATE = 1 – Data

Display simply prints 24 ASCI characters.

### In DISPLAY\_STATE = 2 - signal level

Display needs to decode 24 bytes string as follow:

* Value 0 = empty display
* Value 1 = bottom (right channel) empty square
* Value 2 = top (left channel) empty square
* Value 3 = both bottom and top (left and right channels) empty squares
* Value 5 = bottom (right channel) full square
* Value 6 = top (left channel) full square
* Value 7 = both bottom and top (left and right channels) full squares
* Value 8 = arrow left
* Value 9 = arrow right

### In DISPLAY\_STATE = 3 - spectrum analyser

Display needs to decode 24 bytes string as follow:

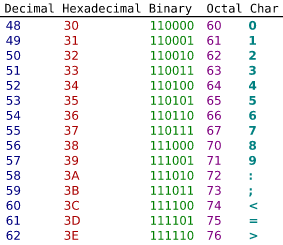
1st and 12th characters – blank space

2nd character – letter “L”

13th character – letter “R”

For characters from 3rd to 11th and from 14th to 24th

* ASCI 0 -> blank
* ASCI 1 -> 3 bottom dots
* ASCI 2 -> 5 bottom dots
* ASCI 3 -> 5 bottom dots and 3 dots in 2nd line
* ASCI 4 -> 5 bottom dots and 5 dots in 2nd line
* ASCI 5 -> …
* ASCI > -> full array of 7 x 5 dots ON



### In DISPLAY\_STATE = 4 - Clock 1

Display module in Clock 1 mode

### In DISPLAY\_STATE = 4 - Clock 2

Display module in Clock 2 mode